

IRD Mechanalysis

MODEL 820 Vibration/ Spike Energy Analyzer

Instructor's Guide

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Model 820 Part Numbers:

Complete Training Program	29997
Slide/Tapes	29994
Workbook	29995
Instructor's Guide	29996

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USE OF INSTRUCTOR'S GUIDE

This guide was designed for those who use this program in group instruction to derive the most benefits from the learning experience.

Familiarize yourself with the contents of this book, the slide/tapes, and the operation of the Model 820 until you become comfortable with teaching the course to a group.

PROGRAM OBJECTIVES

Rotating machines that are properly installed and maintained will give years of trouble-free service. Unfortunately, many machines develop mechanical problems that go undetected until a serious failure occurs.

The Model 820 has been developed to make the job of measuring, analyzing, recording machine vibration, and finding those problems easier. Individuals completing this training program will develop an understanding of the features and operation of the Model 820, as well as how to use this instrument in a predictive maintenance program.

PERFORMANCE OBJECTIVES

1. By viewing the slide/tapes, answering a series of multiple-choice questions, and performing hands-on exercises, the trainee will be able to:
 - Identify the features and capabilities of the Model 820.
 - Use the Model 820 to obtain vibration signatures.
2. Given a familiarity for the Model 820, the trainee will be able to:
 - Determine a machine's mechanical condition by vibration measurements and analysis.
 - Produce hard-copy printouts of machine vibration spectra.

MATERIALS REQUIRED

Model 820 Vibration/Spike Energy Analyzer

Model 970 Accelerometer

Pickup Cable

Chart Paper

9-inch Probe

Magnetic Holder

Battery Charger

Model 820 Workbook

Model 820 Slide/Tapes

Part 1

Part 2

Access to electricity

Machine suitable for taking practice measurements

Kodak Carousel® projector, cassette recorder, and screen

OR

Automatically synchronized slide/tape viewer

Optional Accessories (May be used at Instructor's option)

Model 308 Vibration/Sound Level Meter

Model 544 Velocity Pickup and Cable

Photoelectric Reference Pickup

Electromagnetic Reference Pickup

IRD Calibrator

Spare Battery Pack

Battery Pack Charger Adapter

PREPARATION

1. Provide an adequate classroom environment with comfortable seating, tables, chalkboard, and screen.
2. Gather all the required materials, A-V equipment, and demonstration aids.
 - Classroom demonstrations and hands-on experience are helpful to the learning process. Have at least one IRD Model 820 and accessories available for class use.
 - The Workbooks contain practice exercises to help the trainees learn the information presented, as well as serving as reference material.
3. Set up and learn how to use your A-V equipment.
 - Check the operating condition of all the equipment. Set the recorder at an adequate sound level. Advance the slide tray to the first slide and focus before turning on the recorder.
 - For your convenience the slides have been loaded into Carousel® trays and two cassettes are provided for each tray.

One tape, marked **MANUAL**, can be played on any standard cassette recorder. It has audible tones which signal you to advance the projector to the next slide.

The other cassette in each box, labeled **AUTOMATIC**, is for use on equipment having automatic sync pulses that will automatically advance the projector.

NOTE: In a classroom situation, the use of automatic equipment is highly recommended.
4. View the Slide/Tapes, Part 1 and 2. Read the material in the Workbook. Complete the exercises. In other words, become familiar with all the material.
5. Review the LESSON PLAN for this training program.
6. Adjust the suggested amounts of time for each activity according to your classroom situation, number of trainees, and equipment available.
7. Practice the demonstrations.
8. Make your own presentation notes directly on these pages to refer to during class.

LESSON PLAN

The IRD Model 820 Training Program is designed as a half-day instruction session; however, to allow additional hands-on experience and use of the Optional Accessories, it may be extended to a full day.

(10 min.)

1. Introduce the program.

Briefly explain the purpose of the training session and describe the areas to be covered:

- Features of the Model 820.
- How to use the Model 820.

(10 min.)

2. Describe the general purpose of the Model 820 Vibration/Spike Energy Analyzer. Explain how it fits into a predictive maintenance program. Give examples of how the Model 820 has proved successful in plants similar to those of the trainees.

3. Distribute Workbooks.

(15 min.)

4. Show Slide/Tape: Part 1.

(45 min.)

5. Following the presentation, point out each of the features discussed in the slide/tape. Then, ask the trainees to complete the exercises for Part 1 found in their Workbooks.
 - As a group, check the answers to each question.
 - Demonstrate how to make a TEST SIGNAL and show what to look for when checking the operating condition of the Model 820.
 - Answer any questions from the trainees and review any information they found confusing.

(15 min.)

BREAK

(30 min.)

6. Show Slide/Tape: Part 2.
7. Demonstrate how to obtain a **Sound Level vs. Frequency Plot** using the Model 308 and the Model 820.
 - Obtain several printouts from different positions on a machine.
 - Use the various features of the Model 820 to change amplitude, change frequency range, determine over-scale amplitudes, adjust chart speed, etc.
 - Review the printouts, pointing out what things to look for.

- (30 min.) 8. Demonstrate how to obtain an **Amplitude vs. Time Plot**.
- Obtain several printouts.
 - Use the various features of the Model 820 to pause a plot, adjust the amplitude, record a startup and coastdown, determine an exact frequency, etc.
 - Review the printouts.
- (15 min.) 9. Demonstrate how to obtain **Spike Energy vs. Time Plots**.
- Obtain several printouts.
 - Show how to obtain a series of bearing measurements. Identify them on the printout.
- (60 min.) 10. Ask the trainees to complete the exercises for Part 2.
- As a group, check the answers to the questions and discuss the hands-on exercises.
- NOTE:** According to the instructor's plans, if the optional accessories and procedures are to be demonstrated, ask the trainees to wait until the afternoon session to complete the Optional Exercises.

LUNCH

OPTIONAL AFTERNOON SESSION

- (60 min.) 11. Based on the availability of practice machinery and the number of Model 820s on hand, provide this additional time for hands-on experience.
- (20 min.) 12. Demonstrate how to measure and plot noise data using the Model 308 Vibration/Sound Level Meter.
- Set up and obtain a Sound Level vs. Frequency Plot.
 - Show how to change the "0 to 1" scale to decibels on the printout.
- (20 min.) 13. Demonstrate how to obtain the rotating speed (RPM) of machines, using either a Photoelectric Reference Pickup or an Electromagnetic Reference Pickup.
- (45 min.) 14. Ask the trainees to complete the Optional Exercises.
- Check the answers and review the hands-on exercises.

